



NA-510 Series
SMB Network Appliance
User's Manual



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Safety Approvals

- ◆ CE Marking
- ◆ FCC Class A

◆ FCC Compliance

This equipment has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

Safety Precautions

Before getting started, read the following important cautions.

1. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
2. Disconnect the power cords from the **NA-510 Series** before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the **NA-510 Series** is properly grounded.
3. Do not open the system's top cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
 - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
 - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

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CHAPTER 1

INTRODUCTION

This chapter contains general information and detailed specifications of the **NA-510 Series** Network Appliance Server. Chapter 1 contains the following sections:

General Description

Features

Specifications

Dimensions

I/O Outlets

1.1 General Description

The **NA-510** is a 1U and rack mount network security hardware platform for VPN, firewall and other network security applications. It supports high performance with LGA1156 socket Intel® i3/i5/i7 series.

In addition, the **NA-510** supports up to 8GB un-buffer ECC DDR3 DIMM memory. For storing event log data, the **NA-510** utilizes two 2.5" SATA HDD or one 3.5" SATA HDD. It also supports two groups of LAN bypass through WDT and GPIO pin definition without downtime.

The **NA-510** is designed specially for small to medium sized business. It doesn't only provide high performance for processor, memory, storage interface and LAN ports connection, but also includes outstanding management capability.

1.2 Features

- LGA1156 socket Intel® i3/i5/i7 series.
- LAN1 port support Wake-on-LAN, PXE Boot ROM, iAMT with Intel 82578DM. LAN2 ~ LAN8 ports support PXE Boot ROM with Intel 82574L
- DDR3 DIMM memory up to 8GB un-buffer ECC
- Supports two S-ATA 2.5" HDD or one 3.5" SATA HDD for data or proxy.
- Supports BIOS redirected to COM port
- Suitable for VPN, firewall and other network security applications

1.3 Specifications

1.3.1 System

- **System CPU**
LGA1156 socket Intel® i3/i5/i7 series.
- **System Chipset**
Intel® Q57
- **BIOS**
AMI 64Mbit PnP Flash BIOS with function of BIOS redirected to COM port.
- **System Memory**
Two DDR 3 DIMMs sockets support up to 8GB un-buffer ECC Memory (DDRIII 800/1066/1333)
- **S-ATA II Interface**
Two SATA II channels (two channels are default, one for SATA DOM (limit support for Innodisk i-100, rest of channels are option).
- **Super I/O**
Controller: Winbond W83627DHG
Serial Ports: Total 2 asynchronous ports (2 x RS-232, One 10-pin header is on board, other one RJ on the edge of the board).
- **CompactFlash™**
CompactFlash™ socket onboard.
- **USB**
Four USB (2.0) ports, two USB box headers internally, and one dual port external connector.

- **LAN**
 LAN1 to LAN8 physical port can complete mapping with eth0 to eth7 port by port of Linux environment.
 Support 2 groups LAN by-pass for LAN2 and LAN3, LAN4 and LAN5
- **Hardware Monitoring**
 - Controller Winbond W83627DHG
 - Detection of CPU temperature, system temperature, power failure and fan speed
- **Watchdog Timer**
 - 255 steppings for porting.
 - WDT function (Lan by pass or system reset) could be controlled by BIOS.
- **Other Features**
 - NA-510 can provide two group Lan by Pass(LAN2 、 LAN3 and LAN4 、 LAN5) That design should including GPIO control, WDT (Trigger LAN by Pass at the same time) and power failed.
 - Optional reset and power on/off function on board (Pin for front panel).
 - USB controller integrated in Q57 could be disabled by BIOS. And also supported boot from USB features.
 - Support USB DOM and USB wireless
- **OS Compatibility**
 - Linux Red Hat 2.6

1.3.2 Mechanical / Environmental

- **Form Factor**
1U rack mount
- **LED**
Power, HDD, Lan By Pass. Link / Act with transfer rate .
- **Operation Temp.**
0°C ~ 45°C (32 ~ 113°F)
- **Storage Temp.**
-20°C ~ 70°C (-4 ~ 158°F)
- **Humidity**
10% - 95% RH, non-condensing
- **Chassis Material**
Steel
- **Dimensions**
44mm (1.73") (H) x 430mm (16.92") (W) x 392mm (15.43") (D)
- **Certification**
FCC class A , CE class A

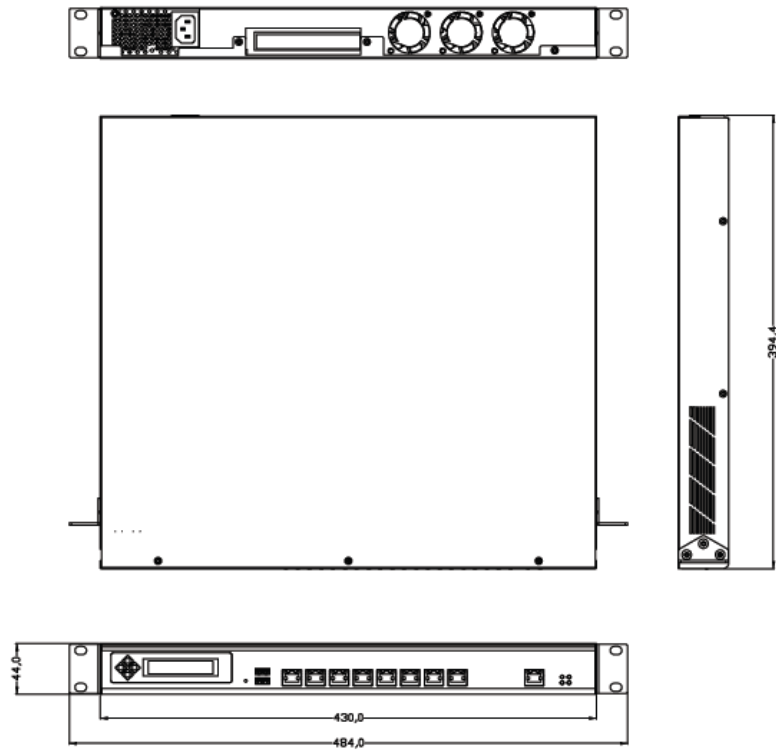


NOTE

All specifications and images are subject to change without notice.

1.4 Dimensions and Outlines

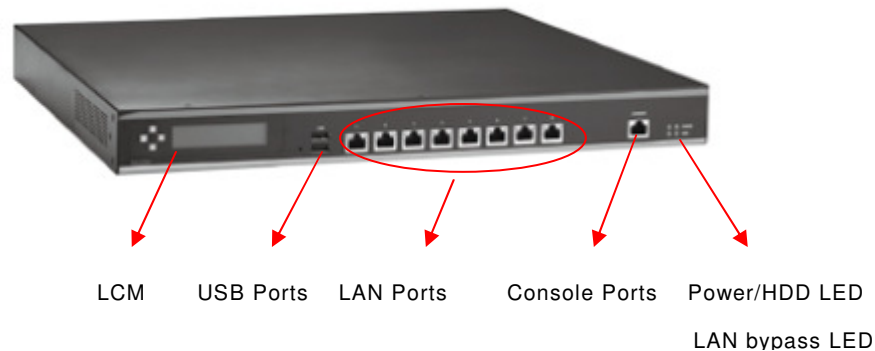
The following diagrams show you dimensions and outlines of the **NA-510 Series**.



1.5 I/O Outlets

Locate front and rear panel I/O outlets on the **NA-510 Series** server to connect serial and Ethernet interface devices.

1.5.1 Front Panel



- **Power LED**
It will be lighting when the server is powered on to perform diagnostic tests and check a proper operation.
- **HDD LED**
The LED flashes when transmitting or receiving any signals.
- **LAN bypass LED**
While running the LAN By-Pass function, the LED always lights up.
- **Link/Active LED (Single color)for for LAN port #1, port#2, port#3, port#4, port #5, port#6, port#7, port#8**
 - The orange LED is on when the LAN port connection is working.
 - The LED flashes when transmitting or receiving any signals to or from the appliance.
 - The LED is dark when the appliance is off.
- **Transmitted LED for LAN port #1, port#2, port#3, port#4, port#5 and port#6, port#7, port#8**
 - The double-color LED light indicates 10/100/1000Mbps transfer rate.
 - When the amber-color LED light is radiating, it should be 1000Mbps transfer rate at this moment.
 - When the green-color LED light is radiating, it should be 100Mbps transfer rate at this moment.

- If the LED is dark and Link/Active LED is light on or flashing, it should be 10Mbps transfer rate.
- When this LED and Link/Active LED both are dark. No networking devices are attached

Transfer Rate	LED Light Color
10Mbps	Dark
100Mbps	Green
1000Mbps	Amber

- **Console port**
It is a RJ-45 Console port for command line interface and diagnostic support by P.O.S.T (Power On Self Test).
- **USB Ports**
Any special functions must be defined by solution provider.
- **Transfer Rate**
It shows network transfer rate while making a connection.
- **Activity**
It will be lighting when the server is transmitting or receiving a packet through the twisted pair ports.

1.5.2 Rear Panel



CHAPTER 2

HARDWARE AND INSTALLATION

The NA-510 Series are convenient for your various hardware configurations. The chapter 2 will help you get familiar with the hardware.

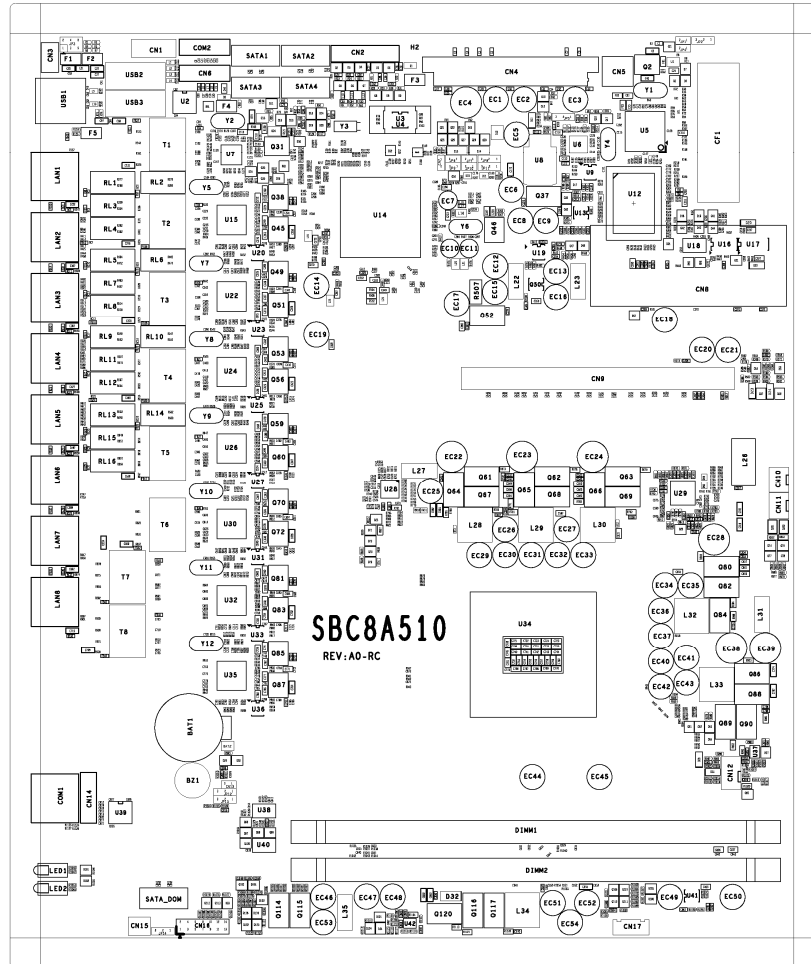
2.1 Checklist

The package bundled with your NA-510 Series should contain the following items:

- The **NA-510 Series** network appliance hardware platform
- Power cord x 1
- Utility CD (including User's Manual& Sample Code)
- Mounting brackets for rack installation (left/right) x 2
- Plastic stand for stack-up x 4
- Mounting screws for disk drive and additional screws for this appliance's spare parts
- RJ console cable x 1
- SATA II cable x2
- CPU Heatsink x1

If you can not find this package or any items are missing, please contact AXIOMTEK distributors immediately. If you order any optional components, the package might contain those additional hardware or documents accordingly.

2.2 Board Layout



2.3 Jumper Settings

This section provides the information about jumpers and connectors of **NA-510 Series**. Proper jumper settings configure the main board in this appliance to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Jumper	Jumper Settings	Function
JP1	Open	CF Function Enable (Default)
	Short	CF Function Disable
JP2	Short (1-2)	CF Voltage Select : 3.3V(Default)
	Short (2-3)	CF Voltage Select : 5V
JP3 (reserved)	Short (1-2)	Power Button
	Short (3-4)	Reset
	Short (5-6)	GPIO28
JP4	Open	Auto Power On (Default)
	Short	Power on By Power button
JP5	Short (1-2)	CPU Clock:133MHz (Default)
	Short (2-3)	CPU Clock:100MHz
JP8	Short (1-2)	LAN4 & LAN5 Bypass Always Disable
	Short (2-3)	LAN4 & LAN5 Bypass Always Enable
	Open	LAN4 & LAN5 Bypass control by JP7 or JP10 or WDT(appendix A)(Default)
JP10 / JP7	Short / Open	LAN4 & LAN5 Bypass Trigger 1 GPO High Level (By Pass Disable)(Default)
	Open / Short	LAN4 & LAN5 Bypass Trigger 2 GPO Low Level (By Pass Enable)
JP11	Short (1-2)	LAN2 & LAN3 Bypass Always Disable
	Short (2-3)	LAN2 & LAN3 Bypass Always Enable
	Open	LAN2 & LAN3 Bypass control by JP6 or JP9 or WDT(appendix A)(Default)
JP6 / JP9	Short / Open	LAN2 & LAN3 Bypass Trigger 1 GPO High Level (By Pass Disable)(Default)
	Open / Short	LAN2 & LAN3 Bypass Trigger 2 GPO Low Level (By Pass Enable)
JP13	Short (1-2)	Normal(Default)
	Short (2-3)	Clear BIOS CMOS
JP14	Short (1-2)	SATA DOM Pin7 GND (Default)
	Short (2-3)	SATA DOM Pin7 VCC (+5V)

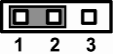
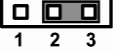
2.3.1 CompactFlash™ Function Jumper (JP1)

This jumper is to enable or disable the CompactFlash™ interface.

Description	Function	Jumper Setting
CF Function	CF Function Disable	
	CF Function Enable (Default)	

2.3.2 CompactFlash™ Voltage Jumper (JP2)

This jumper is to select the voltage for CompactFlash™ interface.

Description	Function	Jumper Setting
CF Voltage	3.3V (Default)	
	5V	

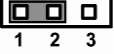
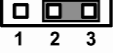
2.3.3 Auto Power on Jumper (JP4)

You may need to this jumper to select auto power on or ATX power on.

Description	Function	Jumper Setting
Power on Select	Power On by Power Button	
	Auto power on (Default)	

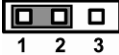
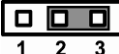
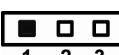
2.3.4 CPU Clock Select (JP5)

This jumper is to select CPU clock.

Description	Function	Jumper Setting
CPU Clock	133MHz (Default)	
	100MHz	

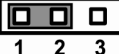
2.3.5 LAN Bypass Group 1 (LAN2 & LAN3) Control Jumper(JP11)

Use this jumper to select the LAN Bypass Function.

Description	Function	Jumper Setting
LAN Bypass Group 1 (LAN2 & LAN3)	LAN Bypass Always Disable	 1 2 3
	LAN Bypass Always Enable	 1 2 3
	Bypass control by JP6 or JP9 or WDT(appendix A) (Default)	 1 2 3

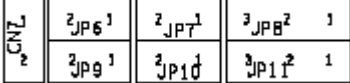
2.3.6 LAN Bypass Group 2 (LAN4 & LAN5) Control Jumper(JP8)

Use this jumper to select the LAN Bypass Function.

Description	Function	Jumper Setting
LAN Bypass Group 2 (LAN4 & LAN5)	LAN Bypass Always Disable	 1 2 3
	LAN Bypass Always Enable	 1 2 3
	Bypass control by JP7 or JP10 or WDT(appendix A) (Default)	 1 2 3

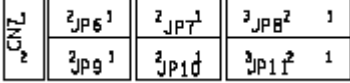
2.3.7 LAN Bypass Group 1 (LAN2 & LAN3) Trigger Jumpers (JP6, JP9)

Use this jumper to select the LAN Bypass High / Low Level.

Description	Function	Jumper Setting
LAN Bypass Group 1 (LAN2 & LAN3) Trigger 1 & 2	Bypass Trigger 1 GPO High Level (By PassDisable) (Default)	JP6  JP9 
	Bypass Trigger 2 GPO Low Level (By Pass Enable)	JP6  JP9 
		

2.3.8 LAN Bypass Group 2 (LAN4&LAN5) Trigger Jumpers (JP7, JP10)

Use this jumper to select the LAN Bypass High / Low Level.

Description	Function	Jumper Setting
LAN Bypass Group 2 (LAN4 & LAN5) Trigger 1 & 2	Bypass Trigger 1 GPO High Level (By PassDisable) (Default)	JP7  JP10 
	Bypass Trigger 2 GPO Low Level (By Pass Enable)	JP7  JP10 
		

2.3.9 Clear BIOS CMOS Jumper (JP13)

You may need to use this jumper is to clear the BIOS CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
Clear BIOS CMOS	Normal (Default)	
	Clear BIOS CMOS	

2.3.10 SATA DOM Jumper (JP14)

You may use this jumper to select Pin 7 of SATA connector to use GND or 5V voltage.

Description	Function	Jumper Setting
SATA DOM	SATA DOM Pin7 GND (Default)	
	SATA DOM Pin7(+5V)	

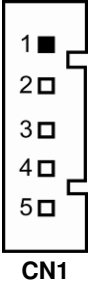
2.4 Connectors

Connectors connect the board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table shows you all connectors on the main board.

Reference	Function
CN1	LCM Connector
CN2	VGA Connector
CN4	ATX 2x12 Power Connector
CN5	ATX 2x2 12V Power Connector
CN6	PS2 KB/MS Connector
CN7	Programming LED pin header
CN8	Mini PCI Slot
CN9	PCI-e x16 Slot
CN10	System FAN3
CN11	System FAN1
CN12	System FAN2
CN13	Case Open pin header
COM1/CN14	COM1 RJ Connector/COM1 10 pin box header
COM2	COM2 10 pin Box Header
CN15	SATA_DOM Power Connector
CN16	Front Panel
SATA1	SATA1 Connector
SATA2	SATA2 Connector
SATA3	SATA3 Connector
SATA4	SATA4 Connector
SATA_DOM	SATA0 Connector
LAN1	LAN1 RJ Connector
LAN2	LAN2 RJ Connector
LAN3	LAN3 RJ Connector
LAN4	LAN4 RJ Connector
LAN5	LAN5 RJ Connector
LAN6	LAN6 RJ Connector
LAN7	LAN7 RJ Connector
LAN8	LAN8 RJ Connector
DIMM1	DDRIII CHA DIMM0
DIMM2	DDRIII CHB DIMM0
CF1	CF Connector

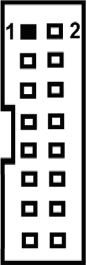
2.4.1 LCM Connector (CN1)

The board provides a LCM (CN1) interface with one 5-pin connector.

Pin	Signal	
1	VCC	
2	RXD of COM2	
3	NC	
4	TXD of COM2	
5	GND	

2.4.2 VGA Connector (CN2)

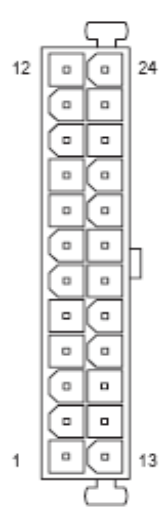
The board supports CRT/ VGA with a 15-pin D-Sub connector for the CRT VGA display.

Pin	Signal	
1	VGA_R	
2	CRT_DETECT	
3	VGA_G	
4	NC	
5	VGA_B	
6	GND	
7	VCC +5V	
8	VGADDCDATA	
9	GND	
10	GND	
11	GND	
12	DAC_L_HSYNC	
13	GND	
14	DAC_L_VSYNC	
15	VGADDCCLK	

2.4.3 ATX 2X12 Power Connector (CN4)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector. If you use a 24-pin ATX power supply, please remove the small cover from the power connector before plugging in the power cord, otherwise, please do not remove it.

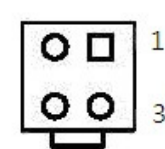
Pin	Signal	Pin	Signal
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR OK	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND



2.4.4 CPU 12V IN Connector (CN5)

Connect the power cable to CN5 for +12V ATX power supply, which mainly supplies power to the CPU. If the CN5 power connector is not connected, the system will not start.

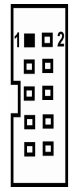
Pin	Signal
1	GND
2	GND
3	+12V
4	+12V



2.4.5 KB/MS Connector (CN6)

This connector is to connect the LCM on the front panel.

Pin	Signal	Pin	Signal
1	VCC	2	KBDATA
3	KBCLK	4	GND
5	VCC	6	VCC
7	MSDATA	8	MSCLK
9	GND	10	NC

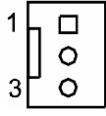


CN6

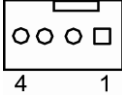
2.4.6 SYSTEM Fan Connectors (CN10 、CN11 、CN12)

A SYSTEM fan is always needed for cooling CPU heat. The SYSTEM fan connectors CN10 、CN11 、CN12 provide power to the SYSTEM fan.

Pin	Signal
1	Ground
2	+12V
3	Rotation Detection



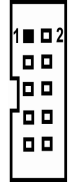
Pin	Signal
1	GND
2	+12V
3	Rotation Detection
4	Speed Control



CN12

2.4.7 COM1 Connector (CN14) / COM2 Connector (COM2)

COM1	Signal
1	Data Carrier Detect (DCD)
2	Data Set Ready (DSR)
3	Receive Data (RXD)
4	Request to Send (RTS)
5	Transmit Data (TXD)
6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)
8	Ring Indicator (RI)
9	Ground (GND)
10	N.C.



2.4.8 SATA Connectors (SATA1-4)

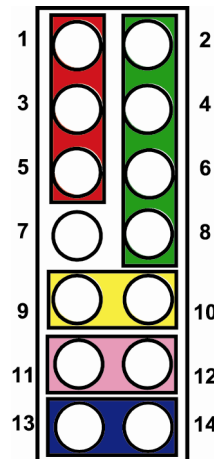
The SATA connectors SATA1-4 for high-speed SATA interface port and it can be connected to serial ATA hard disk devices.

The SATA connector is for high-speed SATA interface ports and each SATA connector supports a single SATA device. Plug one end of the SATA cable to the connector as marked, and the other end of cable to the SATA hard drive.

Pin	Signal	Pin	Signal
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

A diagram of a SATA connector showing a 7-pin layout. The pins are numbered 1 through 7 from top to bottom. Pin 1 is at the top, followed by pins 2, 3, 4, 5, 6, and 7 at the bottom. The diagram shows the physical shape of the connector with the pins protruding from the bottom.

2.4.9 Front Panel Connector (CN16)



➤ **Power LED**

Pin 1, 3, 5 and 7 connect the system power LED indicator to its respective switch on the case. Pin 1 is +, and pin 5 is assigned as -. Pin 7 is defined as NC.

➤ **External Speaker and Internal Buzzer Connector**

Pin 2, 4, 6 and 8 connect to the case-mounted speaker unit or internal buzzer.

➤ **Hardware Reset**

Pin 11 and 12 are designed for Hardware Reset. Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer, not turns OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

➤ **HDD Activity LED**

This connector extends to the hard drive activity LED on the control panel. This LED will flash when the HDD is being accessed. Pin 13 and 14 connect the hard disk drive and the front panel HDD LED.

➤ **Power Button**

This 2-pin connector was designed at Pin 9 and 10.

2.5 Hardware Installation

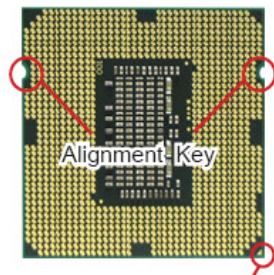
This section provides you the information how to install the **NA-510 Series**.

2.5.1 Installing the Processor

Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.

➤ Introduction to LGA1156 CPU

The pin-pad side of LGA1156 CPU

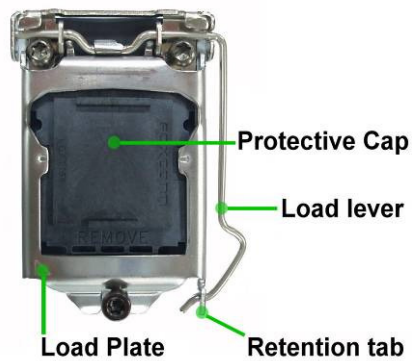


Yellow triangle is the Pin 1 indicator

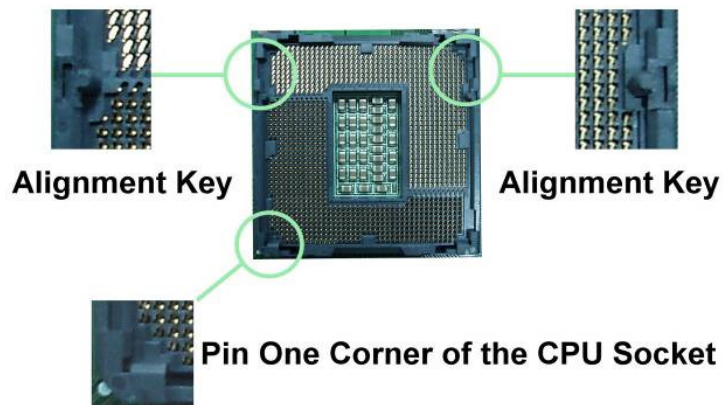
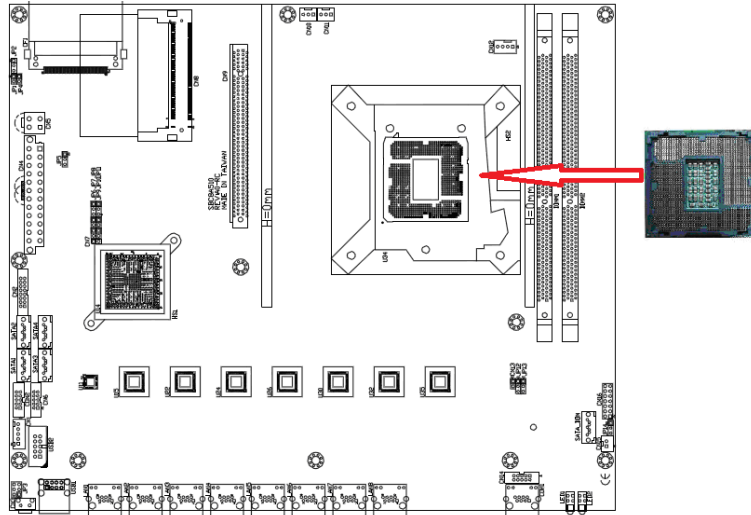


Yellow triangle is the Pin 1 indicator

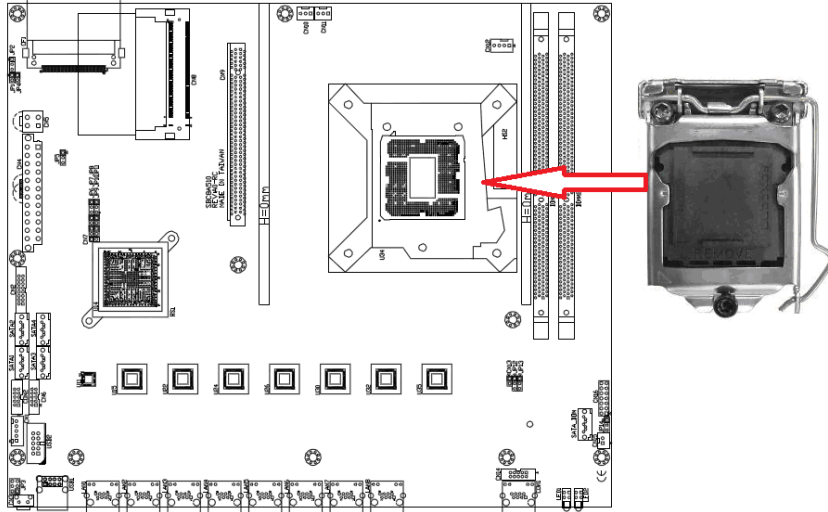
➤ Introduction to LGA1156 CPU socket



- **Locate the alignment keys on the motherboard CPU socket.**

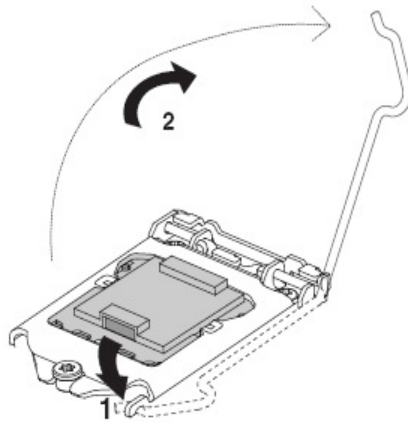


- **Locate the LGA1156 CPU socket on the motherboard**

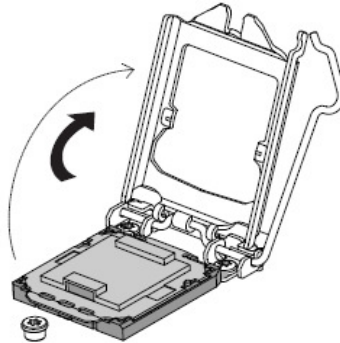


- **Follow the steps below to correctly install the CPU into the motherboard CPU socket**

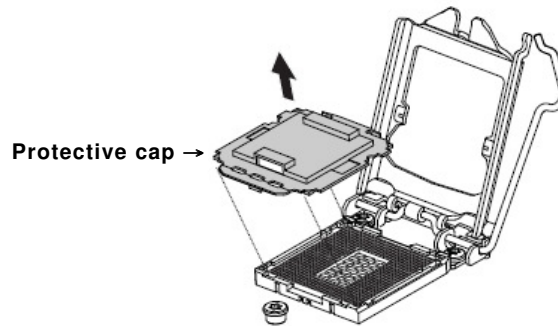
Press the load lever of LGA1156 CPU socket with your thumb and then move it sideways until it is released from the retention tab, then lift the load lever up.



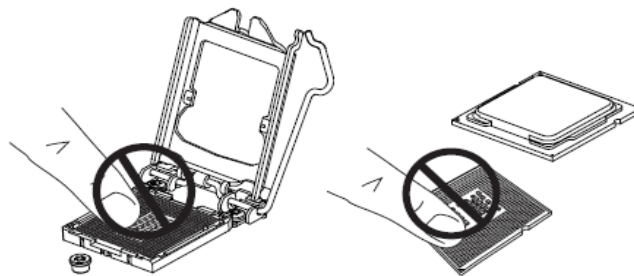
Lift the load lever in the direction of the arrow until load plate is completely lifted.



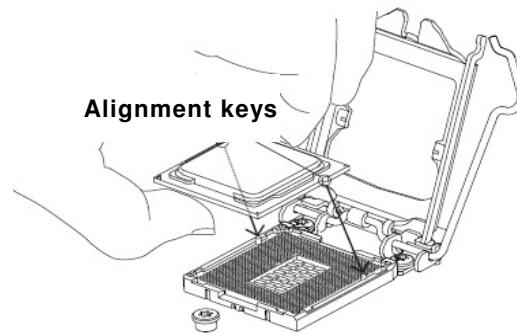
Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



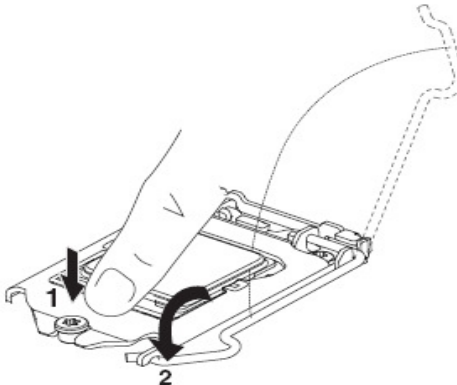
Be careful not touch pin-pad of CPU and pin of CPU socket.



Insert the CPU into the CPU socket. The yellow triangular mark on the CPU must align with the bottom left corner of the CPU socket. Note that the alignment keys are matched. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.



Close the load plate, and then push down the load lever, ensuring that the front edge of the load plate slides under the shoulder screw (1), inserts the load lever under the retention tab (2).



NOTE

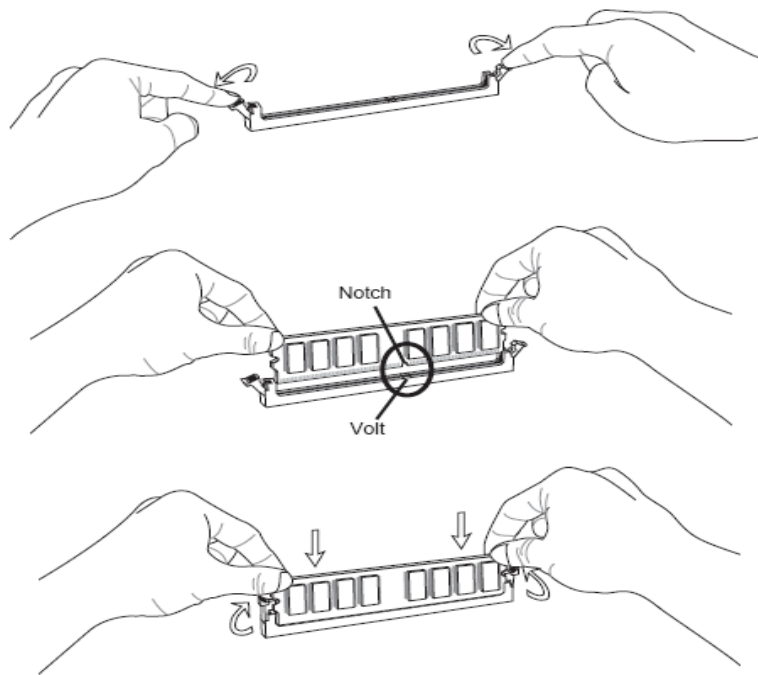
The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

2.5.2 Installing the Memory

The board supports four 240-pin DDR3 DIMM memory sockets with maximum memory capacity up to 16GB.

Please follow steps below to install the memory modules:

1. Push down latches on each side of the DIMM socket.
2. Align the memory module with the socket that notches of memory module must match the socket keys for a correct installation.
3. Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.
4. Install any remaining DIMM modules.
5. You can operate the computer normally.



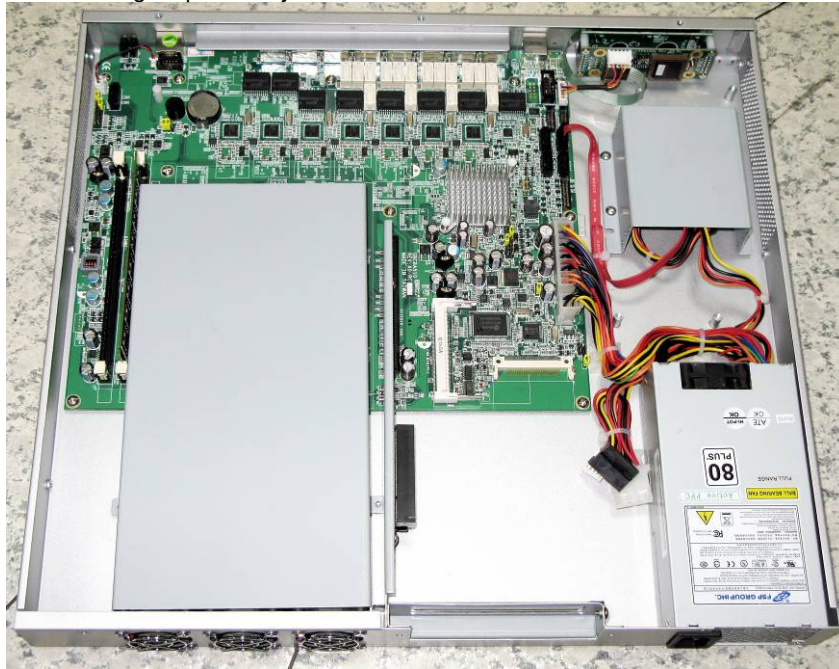
NOTE

A DDR3 module has the same physical dimensions as a DDR3 DIMM but is notched differently to prevent installation on a DDR3 DIMM socket.

2.5.3 Installing the PCI-e Card

The NA-510 supports one PCI-e slot for expansion

The following steps show you how to install the PCI-e card.



Take off all screws from the NA-510 chassis.



Install add-on card to the PCI-e riser card, then fasten screws

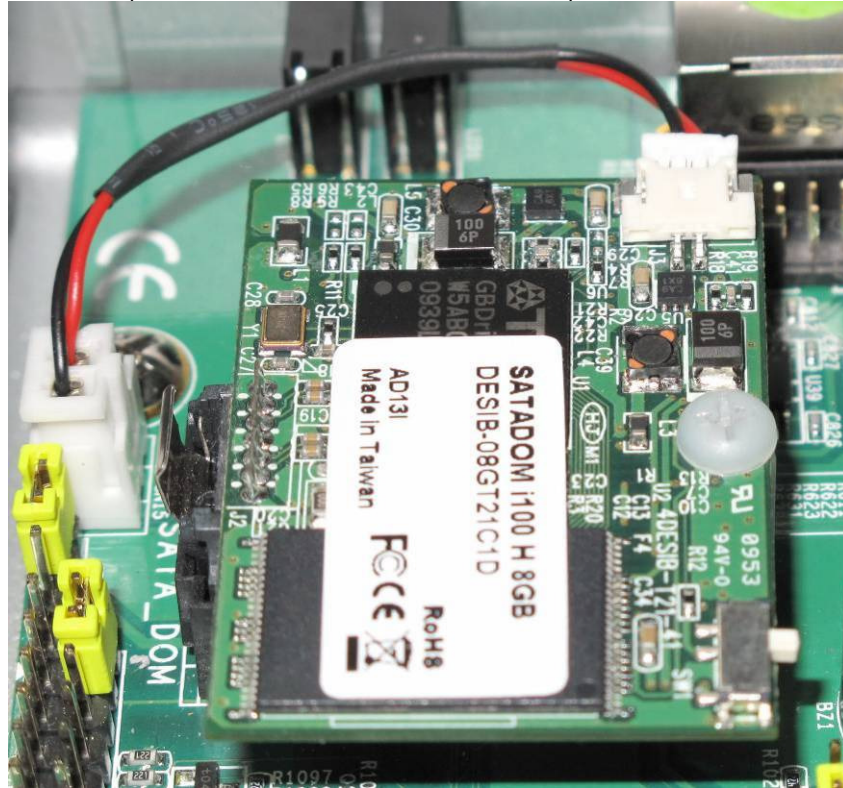


NOTE

Note: Due to chipset limitation, not all of PCIX8 add-on cards can be accepted might have comp ability issues.

2.5.4 Installing SATA DOM

Fasten the plastic screw first and connect the SATA power cable.



CHAPTER 3

AMI BIOS UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

3.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the <Del> key immediately.
2. After you press the <Delete> key, the main BIOS setup menu displays.
3. You can access the other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.

← Left/Right	The Left <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F10	The <F10> key allows you to save any changes you have made and exit Setup. Press the <F10> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

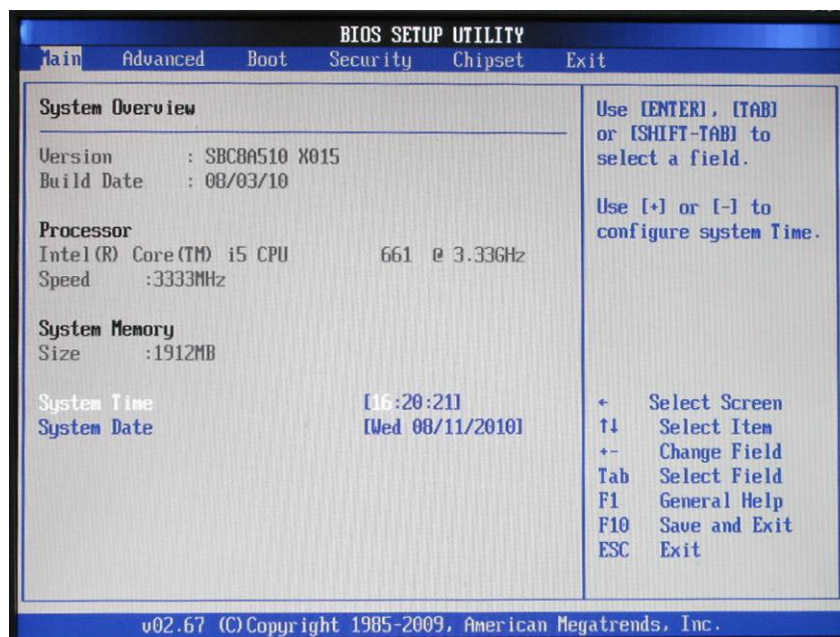


NOTE

Some of navigation keys differ from one screen to another.

3.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



➤ System Time/Date

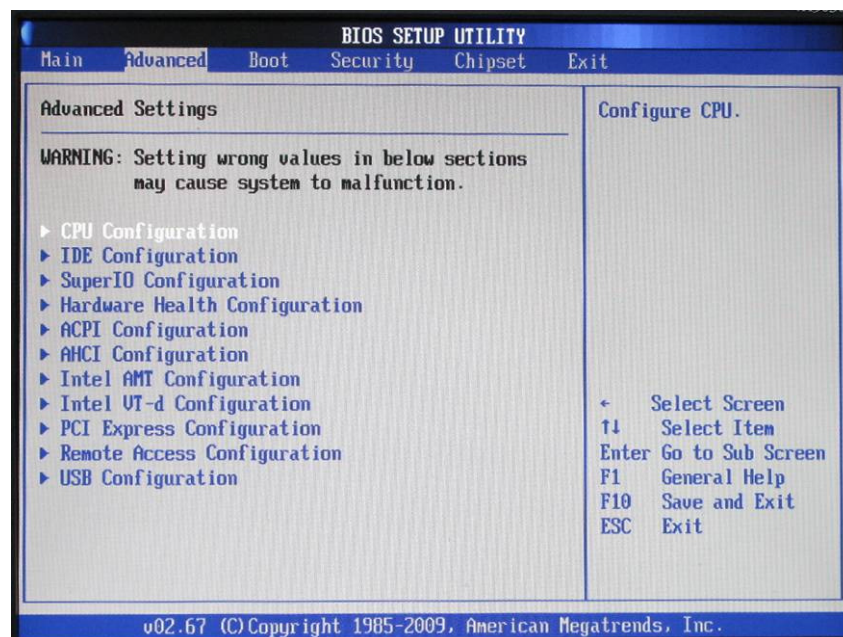
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

3.4 Advanced Menu

The Advanced menu allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

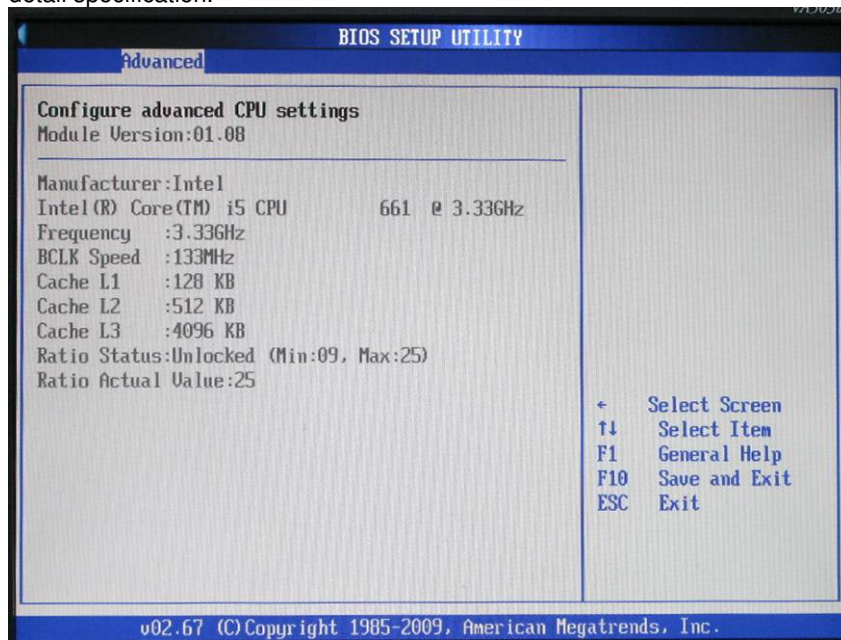
- CPU Configuration
- IDE Configuration
- Super IO Configuration
- Hardware Health Configuration
- ACPI Configuration
- AHCI Configuration
- Intel AMT Configuration
- Intel VT-d Configuration
- PCI Express Configuration
- Remote Access Configuration
- USB Configuration

For items marked with “➤”, please press <Enter> for more options.



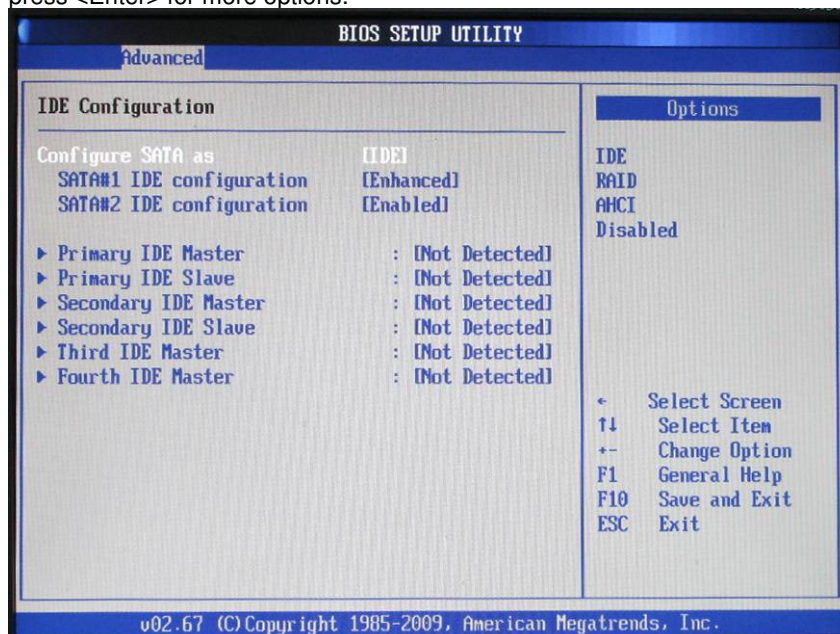
➤ **Advanced Menu – CPU Configuration**

This screen shows the CPU Configuration, and you can know the value of CPU detail specification.



➤ Advanced Menu - IDE Configuration

You can use this screen to select options for the IDE Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



● Configure SATA as IDE 、 RAID 、 AHCI 、 Disabled

Here are the options for your selection, IDE, RAID, AHCI and Disabled.

● SATA#1 IDE Configuration

Use this item to control the onboard SATA controller. The default is "Enhanced" mode

● SATA#2 IDE Configuration

Use this item to control the onboard SATA controller. Here are the options for your selection , Enabled and Disabled.

● Primary / Secondary IDE Master / Slave

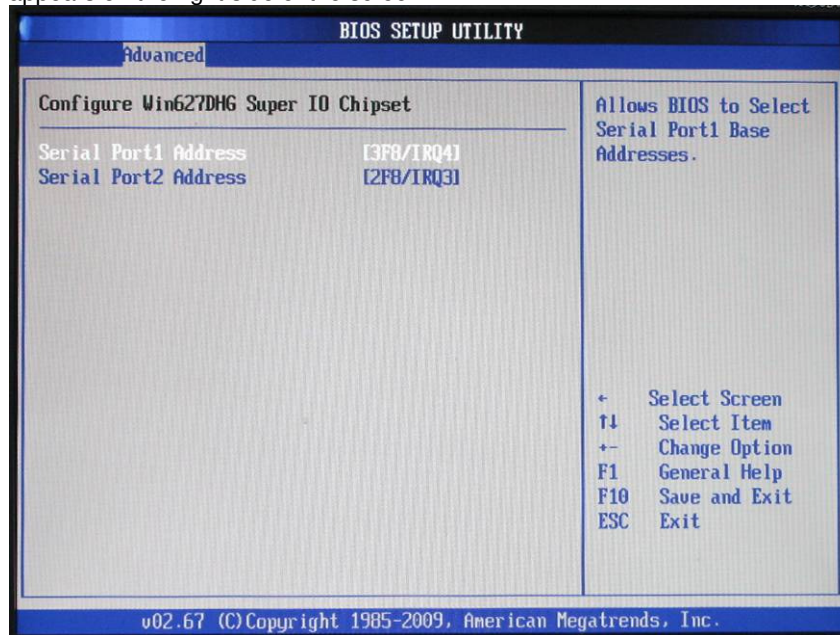
Select one of the hard disk drives to configure IDE devices installed in the system by pressing <Enter> for more options.

● Third / Fourth IDE Master

Select one of the hard disk drives to configure IDE devices installed in the system by pressing <Enter> for more options.

➤ **Advanced Menu – Super IO Configuration**

You can use this screen to select options for the SuperIO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



● **Serial Port1 Address**

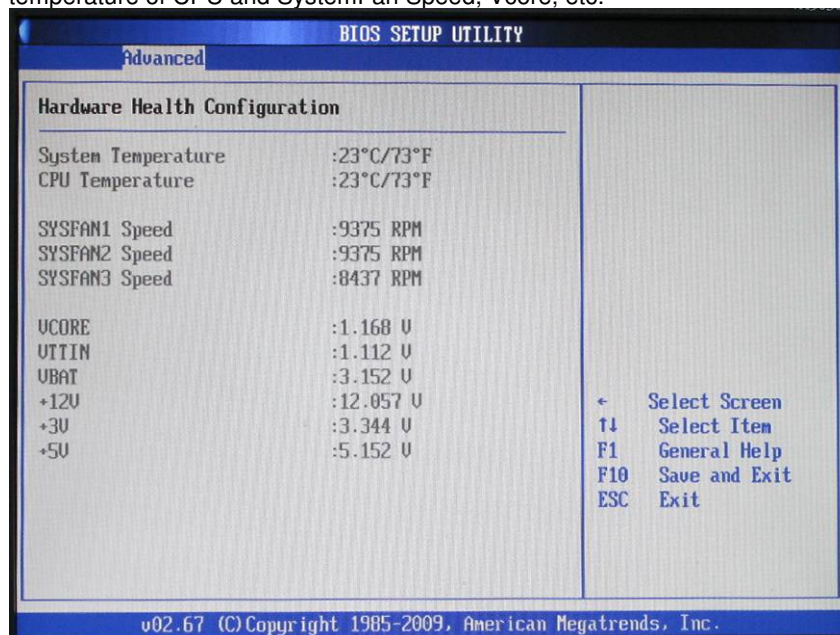
This option specifies the base I/O port address and Default setting is 3F8. Here are the options for your selection, Disabled, 3E8,2E8.

● **Serial Port2 Address**

This option specifies the base I/O port address and Default setting is 2F8. Here are the options for your selection, Disabled, 3E8,2E8 .

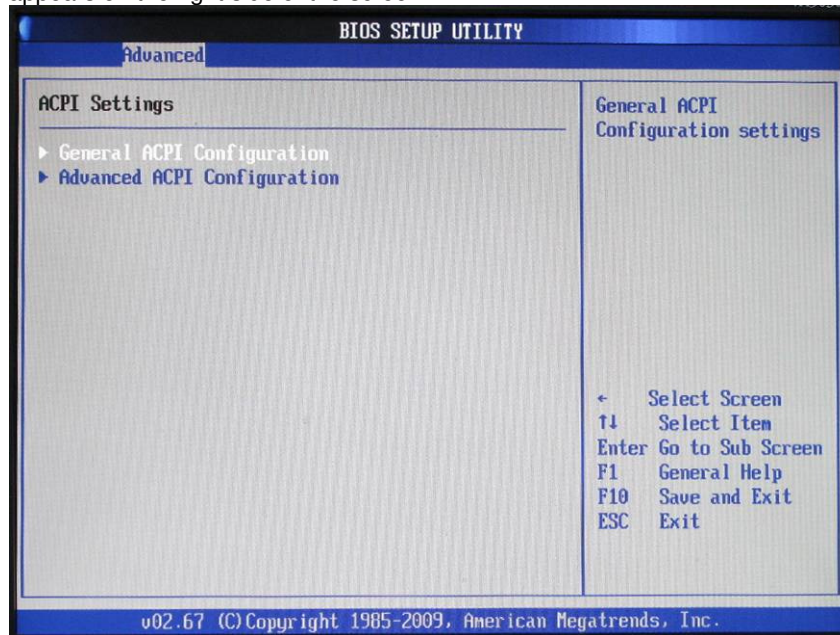
➤ **Advanced Menu – Hardware Health Configuration**

This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen and displays the temperature of CPU and SystemFan Speed, Vcore, etc.



➤ **Advanced Menu – ACPI Configuration**

You can use this screen to select options for the ACPI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



● **General ACPI Configuration**

Scroll to this item and press <Enter> to view the General ACPI Configuration sub menu, which contains General ACPI (Advanced Configuration and Power Management Interface) options for your configuration.

Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection, S1 (POS) and S3 (STR). The default setting is S1(POS).

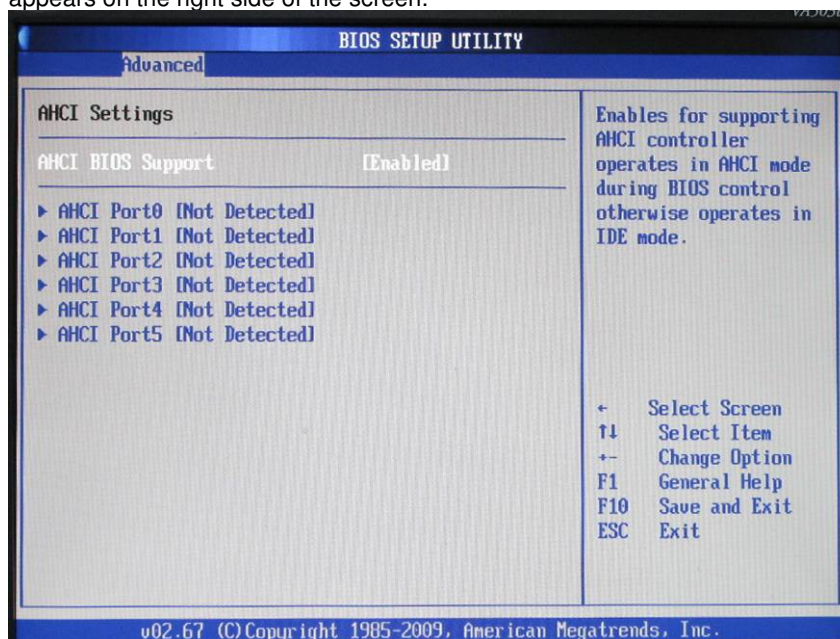
● **Advanced ACPI Configuration**

Scroll to this item and press <Enter> to view the Advanced ACPI Configuration sub menu, which contains Advanced ACPI (Advanced Configuration and Power Management Interface) options for your configuration.

Allow you to select Version for the Advanced Configuration and Power Interface (ACPI). Here are the options for your selection, ACPI v1.0, ACPI v2.0 and ACPI v3.0. The default setting is ACPI v2.0.

➤ Advanced Menu – AHCI Configuration

You can use this screen to select options for the AHCI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



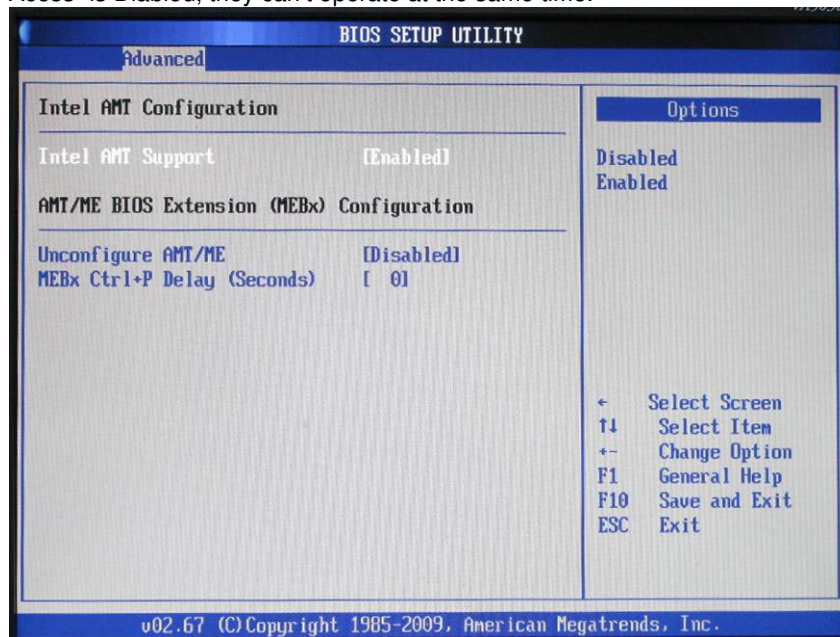
● AHCI BIOS Support

You can Enable or Disable this item to control the AHCI function of the SATA controller. The default setting is enabled.

➤ **Advanced Menu – Intel AMT Configuration**

You can use this screen to select options for the Intel AMT Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

Note : When using Intel AMT Function, you need to make sure “Remote Access” is Disabled, they can’t operate at the same time.



● **Intel AMT Support**

You can enable this item to support AMT (active management technology) function to follow up the procedure for the access to AMI program screen. The default setting is Enabled.

● **Unconfigure AMT/ME**

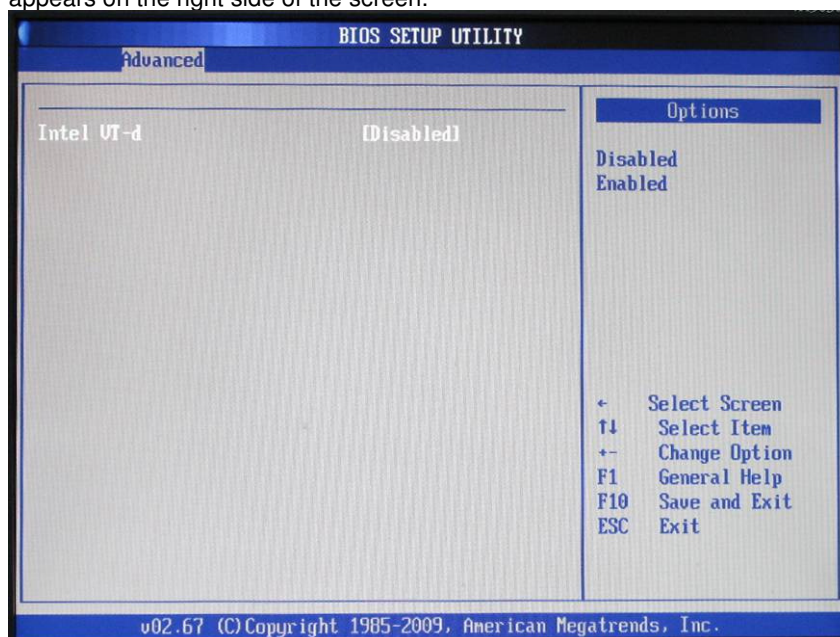
Use this item to unconfigure the AMT/ME settings. The default setting is Disabled.

● **MEBx Ctrl + P Delay (Seconds)**

This option specifies the delay time of the system waits to boot up . The default setting is 0 seconds.

➤ **Advanced Menu – Intel VT-d Configuration**

You can use this screen to select options for the Intel VT-d Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



● **Intel VT-d**

Virtualization Technology for Directed I/O (VT-d) extends Virtualization Technology (VT) roadmap, by providing hardware assists for virtualization solution.

VT-d can help end users improve security and reliability of the systems and also improve performance of I/O devices in virtualized environment. Here are the options for your selection, Disabled and Enabled. The default setting is disabled.

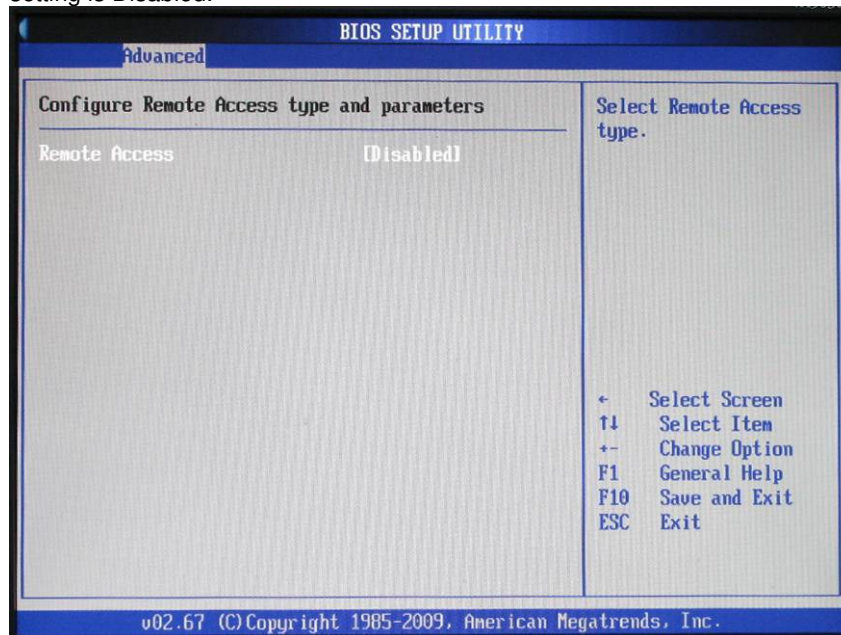
➤ **Advanced Menu – Remote Access Configuration**

You can use this screen to select options for the Remote Access Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

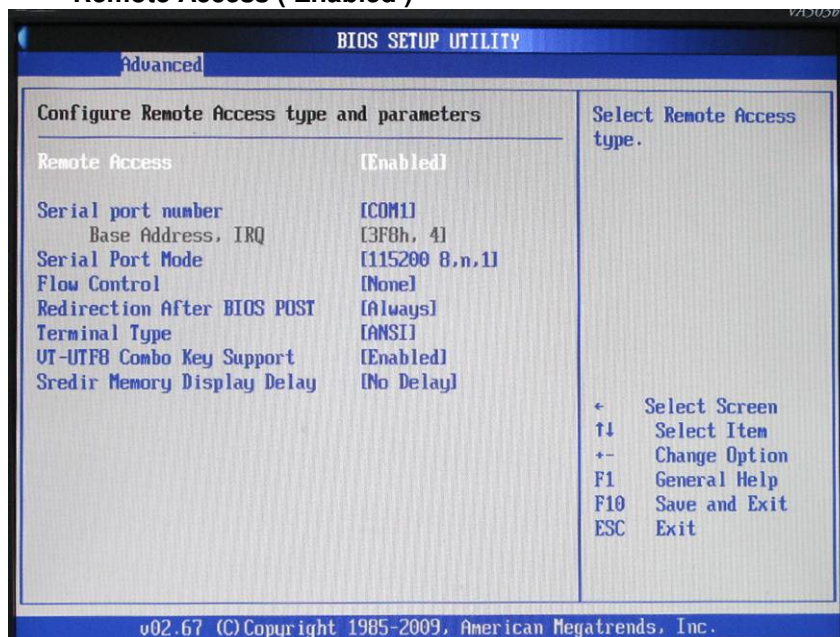
Note : When using Intel AMT Function, you need to make sure “Remote Access” is disabled, they can’t operate at the same time.

● **Remote Access (Disabled)**

Use this item to enable or disable the Remote Access function. The default setting is Disabled.



● Remote Access (Enabled)



● Serial port number

This item specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 3F8/IRQ4.

● Serial Port Mode

This item allows you to setup the data transfer rate for the console port. The default value is 115200. Available options are "9600", "19200", "38400", "57600" and "115200".

● Flow Control

This item allows you to select flow control for console redirection. The configuration options: None, Hardware and Software.

● Redirection After BIOS POST

Use this item to enable or disable the function of Console Redirection, which allows you maintain a system from a remote location. The default setting is Always.

● Terminal Type

This item allows you to select the target terminal type. Configuration options: ANSI, VT100 and VT-UTF8.

- **VT-UTF8 Combo Key Support**

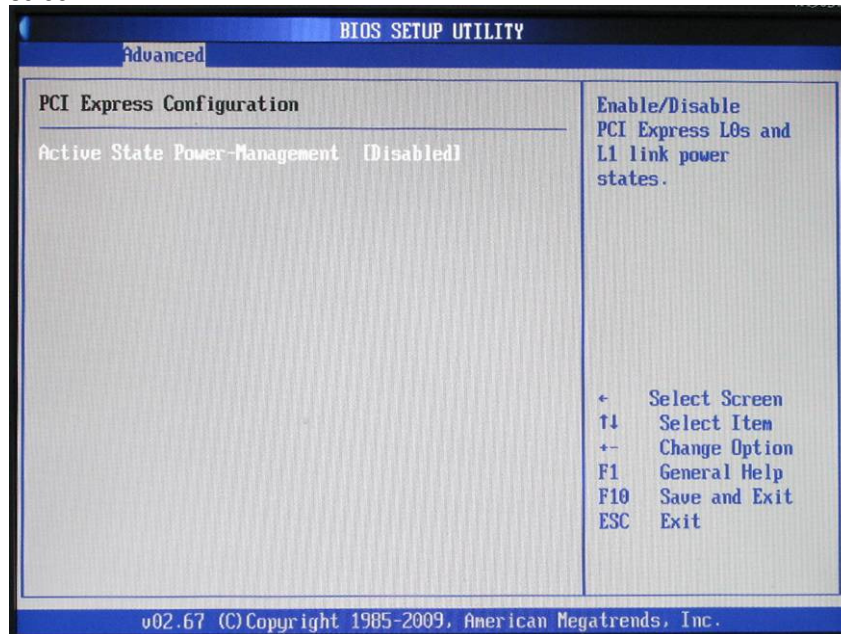
Use this item to “Enabled” or “Disabled” VT-UTF8 combination key supports for ANSI / VT100 terminals.

- **Sredir Memory Display Delay**

This item allows you to indicate the length of time in seconds to off the memory display delay. The default setting is “No delay”.

➤ **Advanced Menu – PCI Express Configuration**

This screen shows the PCI Express Configuration, and you can change its value. A description of the selected item appears on the right side of the screen.

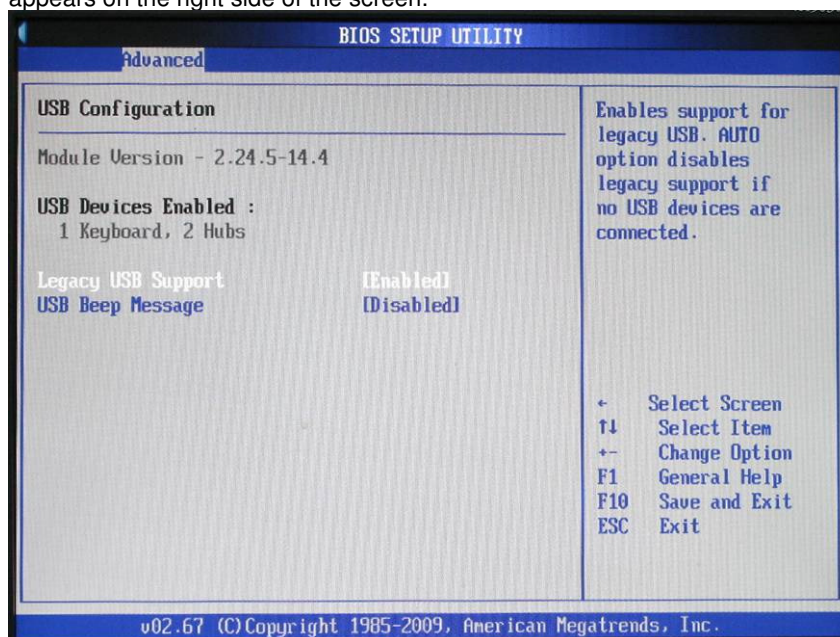


- **Active State Power-Management**

Use this item to enable or disable the function of Active State Power-Management to provide you with lower power consumption. The default setting is Disabled.

➤ **Advanced Menu – USB Configuration**

You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- **Legacy USB Support**

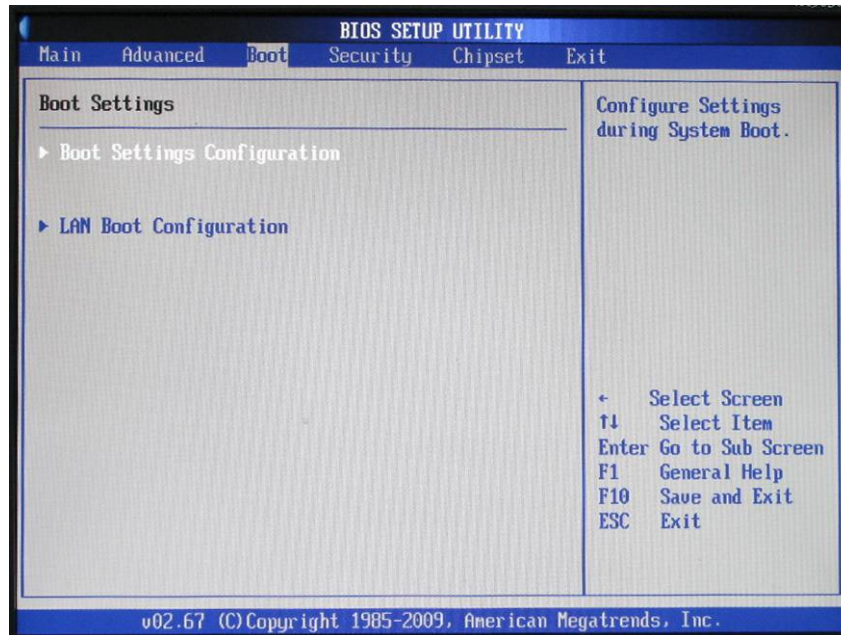
Use this item to enable or disable support for USB device on legacy operating system. The default setting is Enabled.

- **USB Beep Message**

Use this item to enable or disable support for USB Beep Message. The default setting is "Disabled".

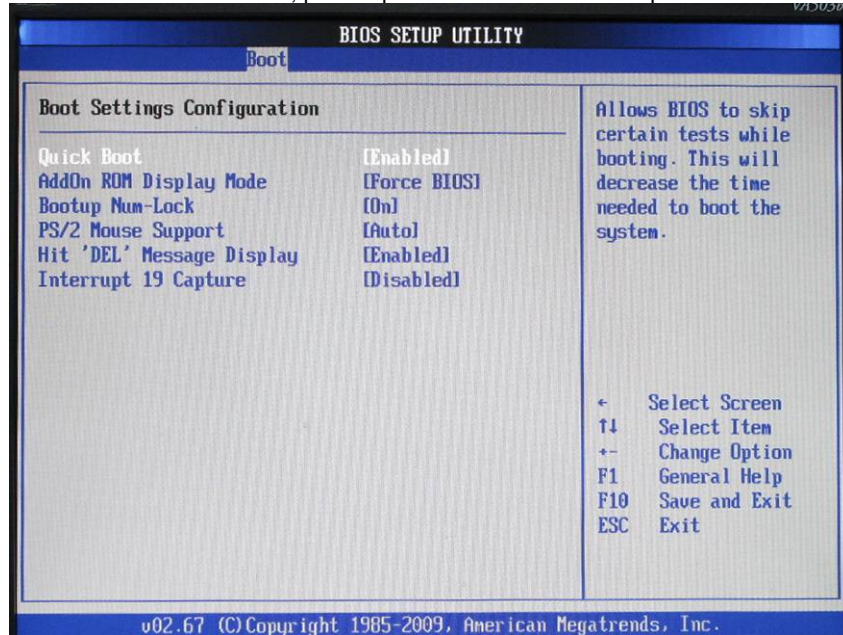
3.5 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus.



➤ Boot Settings Configuration

For items marked with "►", please press <Enter> for more options.



● Quick Boot

Enabling this item lets the BIOS skip certain tests while booting. The default setting is Enabled.

● AddOn ROM Display Mode

This item selects the display mode for option ROM. The default setting is Force BIOS, or you can choose Keep Current.

● Boot Num-Lock

Use this item to select the power-on state for the NumLock. The default setting is On.

● PS/2 Mouse Support

This item determines if the BIOS should reserve IRQ12 for the PS/2 mouse or allow other devices to make use of this IRQ. Here are the options for your selection, Auto, Enabled and Disabled. The default setting is "Auto".

● Hit 'DEL' Message Display

If this item is enabled, the system displays the message "Press DEL to run Setup" during POST. The default setting is Enabled.

- **Interrupt 19 Capture**

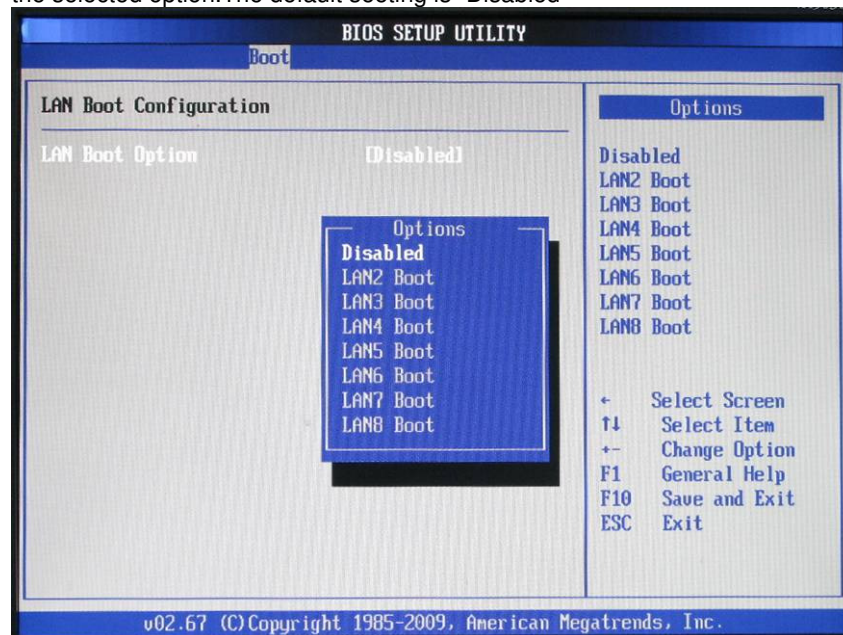
If this item is enabled, this function makes the option ROMs to trap Interrupt 19. The default setting is Disabled.

- **Boot Device Priority**

The Boot Device Priority screen specifies the boot device priority sequence from the available devices.

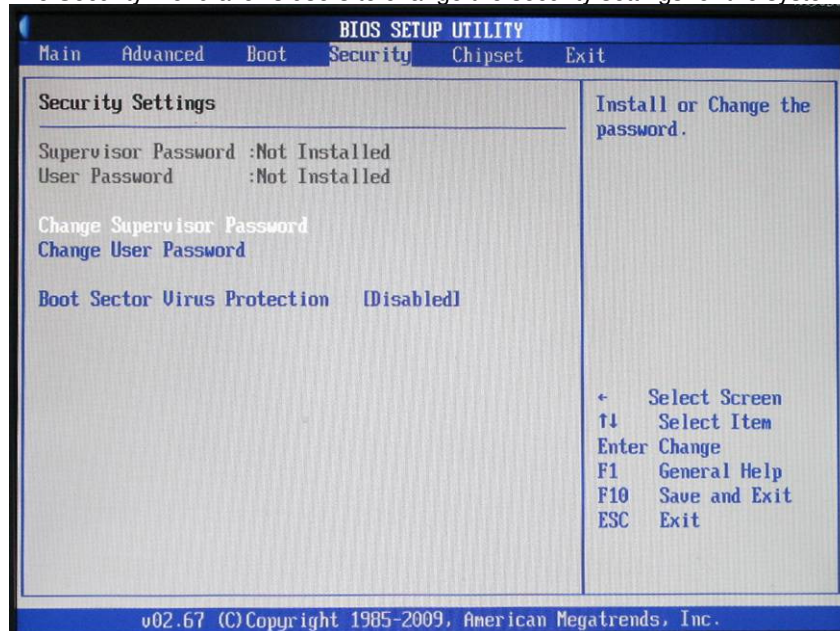
- **LAN Boot Configuration**

This item shows the LAN boot Configuration, and you can change the port of the selected option. The default setting is "Disabled"



3.6 Security Menu

The Security menu allows users to change the security settings for the system.



- **Supervisor Password**

This item indicates whether a supervisor password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **User Password**

This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **Change Supervisor Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

- **Change User Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

- **Boot Sector Virus Protection**

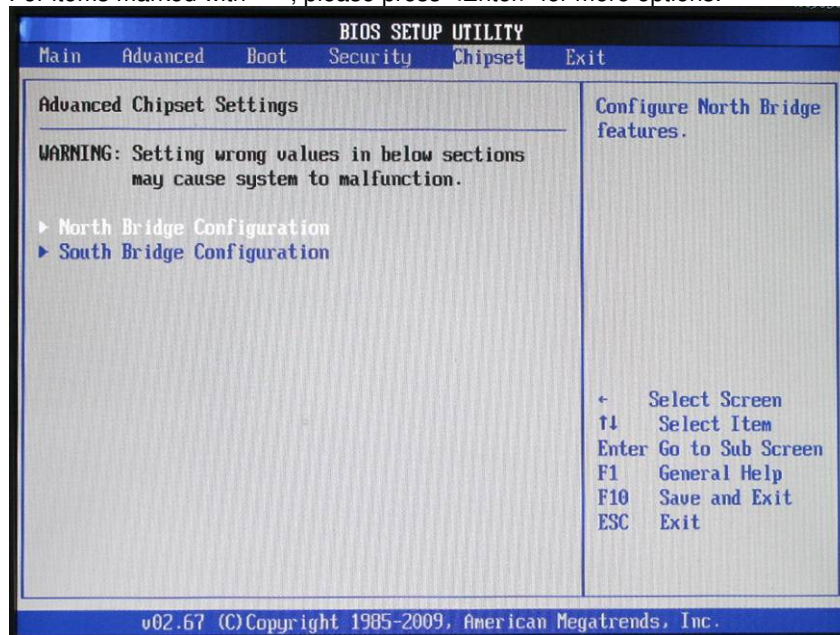
Select this option and press <Enter> to access the sub menu. You can choose "Disabled" or "Enabled". The default setting is "Disabled"

3.7 Chipset Menu

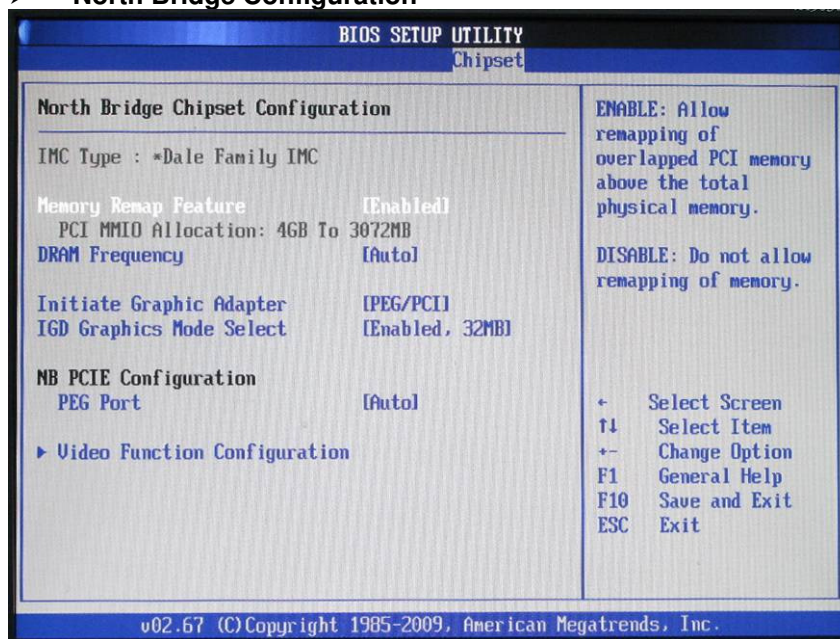
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- North Bridge Configuration
- South Bridge Configuration

For items marked with "➤", please press <Enter> for more options.



➤ North Bridge Configuration



● Memory Remap Feature

Use this item to enable or disable the remapping of the overlapped PCI memory above the total physical memory. The default setting is Enabled. Only 64-bit OS supports this function.

● DRAM Frequency

This item allows you to control the Memory Clock. The default setting is Auto.

● Initiate Graphic Adapter

When using multiple graphics cards, this item can select which graphics controller to be the primary display device during boot. The default setting is PEG/PCI.

● IGD Graphics Mode Select

This item allows you to select the amount of system memory used by the internal graphics device.

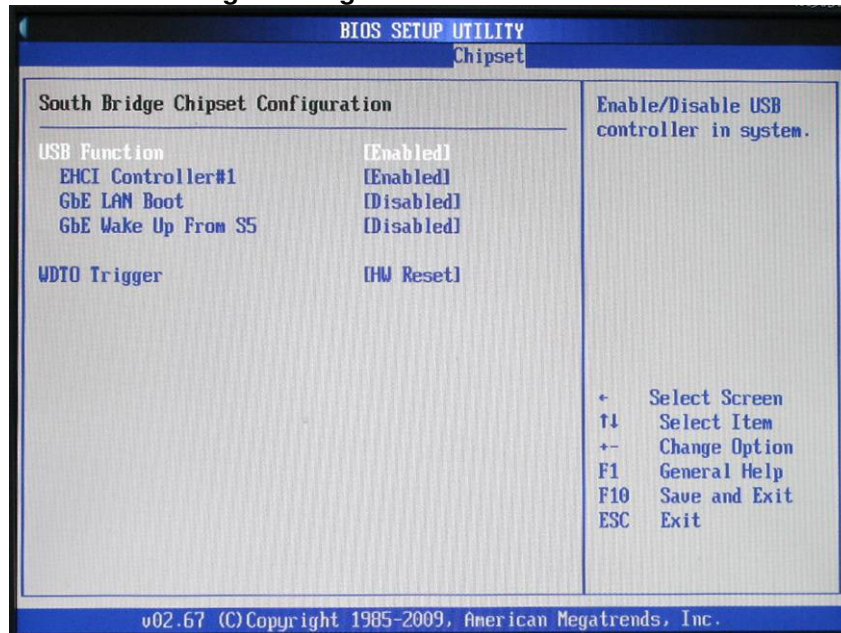
● NB PCIE Configuration/PEG Port

This item is a toggle to enable or disable the PCI Express port. Here are the options for your selection, Auto and Disabled.

- **Video Function Configuration/DVMT/FIXED Memory**

Allow you to allocate a fixed amount of system memory as graphics memory. Here are the options for your selection, 128MB, 256MB and Maximum DVMT.

- **South Bridge Configuration**



- **USB Functions**

This item allows you to enabled or disabled USB controller in system.

- **EHCI Controller**

Host Embedded Communication Interface (HECI) provides an interface for the exchange of message, the default setting is “Enabled”

- **GbE LAN Boot**

This item allows you to enabled or disabled Intel® WG82578DM LAN Boot ROM. The default setting is Disabled.

- **GbE Wake Up From S5**

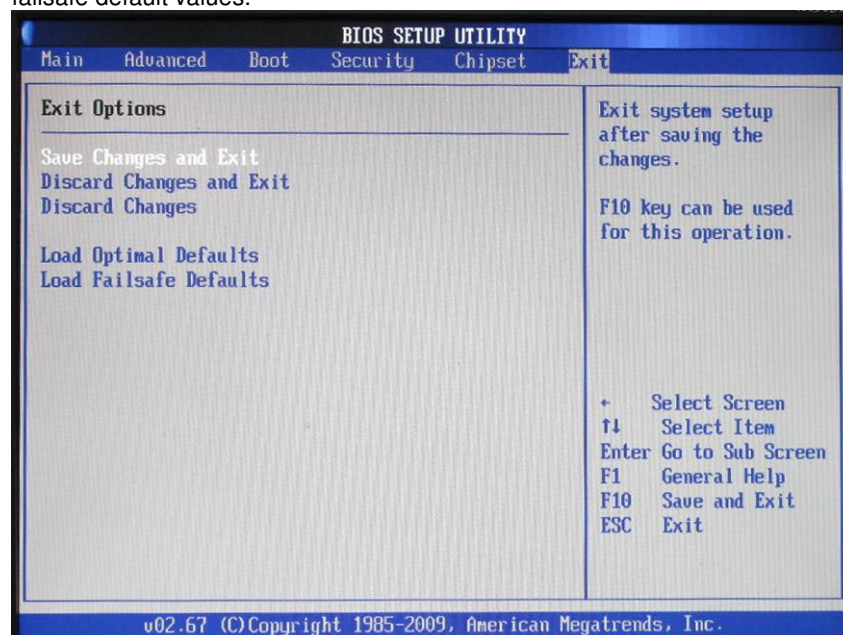
This item specifies whether the system will be awakened from the S5 power. The default setting is Disabled.

- **WDTO Trigger**

The Bios supports the WDT (Watchdog Timer) function. While time-out happens after a defaulted period, the WDT will reset the system or make a short cut Lan by pass for two specific segments by this. The default setting is HW Reset.

3.8 Exit Menu

The Exit menu allows users to load your system configuration with optimal or failsafe default values.



- **Save Changes and Exit**

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>. Select Ok to save changes and exit.

- **Discard Changes and Exit / Discard Changes**

Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes and Exit from the Exit menu and press <Enter>. Select Ok to discard changes and exit.

- **Load Optimal Defaults**

It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

- **Load FailSafe Defaults**

It automatically sets all Setup options to a complete set of default settings when you select this option. The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if your computer is experiencing system configuration problems.

Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. Select Ok to load Fail-Safe defaults.

APPENDIX A

ENABLING LAN BYPASS FEATURE

What is the LAN bypass meant for **NA-510 Series**? It doesn't have any down time in network connections for two other network segments (LAN2 and LAN3 、 LAN4 and LAN5) when any fatal errors occur to this device. The LAN by-pass feature covers three levels as below:

- **Power loss**

While the AC power loss occurs to this device, the LAN2 and LAN3 / LAN4 and LAN5 still can communicate with each other through hardware relay like as a short cut between two segments. If the power inlet can be normally done, the relay will turn to another correct position.

- **GPIO control**

It acts like a switch of the application software. You can enable the hardware relay feature through the GPIO control through the application programs. Then, the software solution provider can be more flexible to make it close with the program.

- **WDT (Watchdog Timer)**

The hardware supports the WDT (Watchdog Timer) function. While time-out happens after a defaulted period, the WDT will reset the system or make a short cut for two specific segments by hardware relay.

Note: Please refer to BIOS “ WDT function selection”.

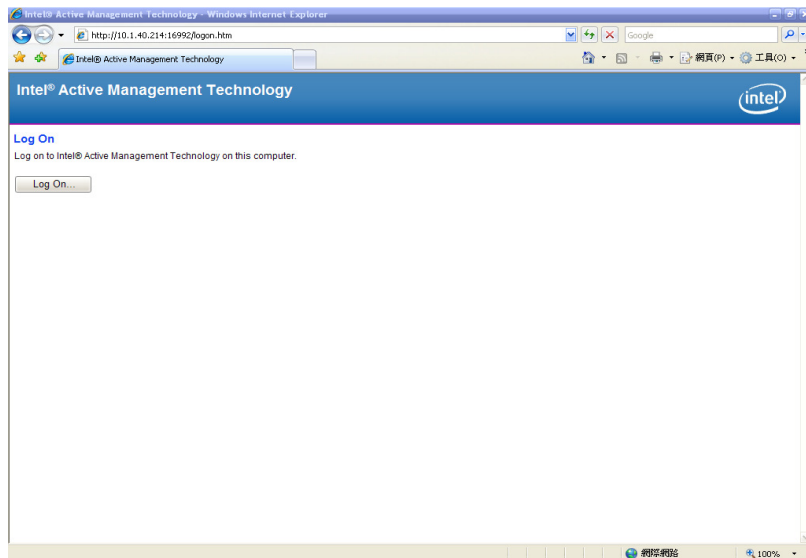


The sample codes for the above features can be found in the CD, and they are only for customers' reference as remarked.

APPENDIX B

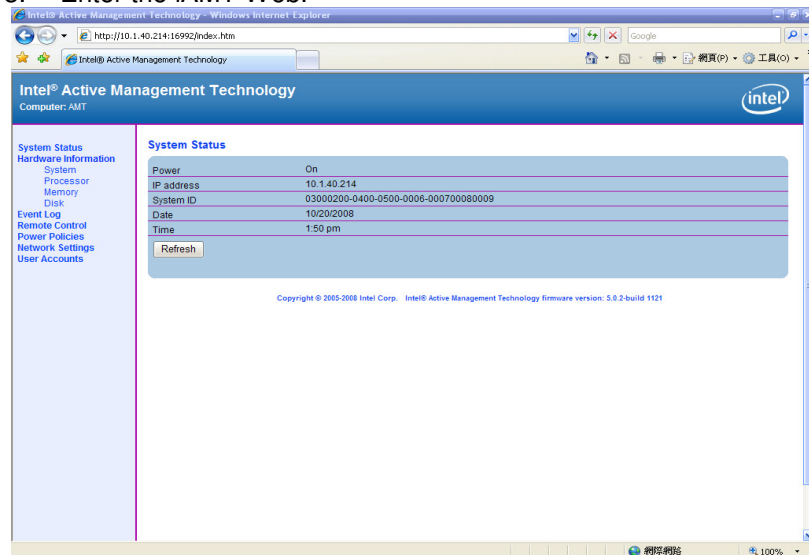
Intel AMT Web Console

1. From a web browser, please type `http :/( IP ADDRESS):16992`, which connects to Intel® iAMT Web.
Example: <http://10.1.40.214:16992>

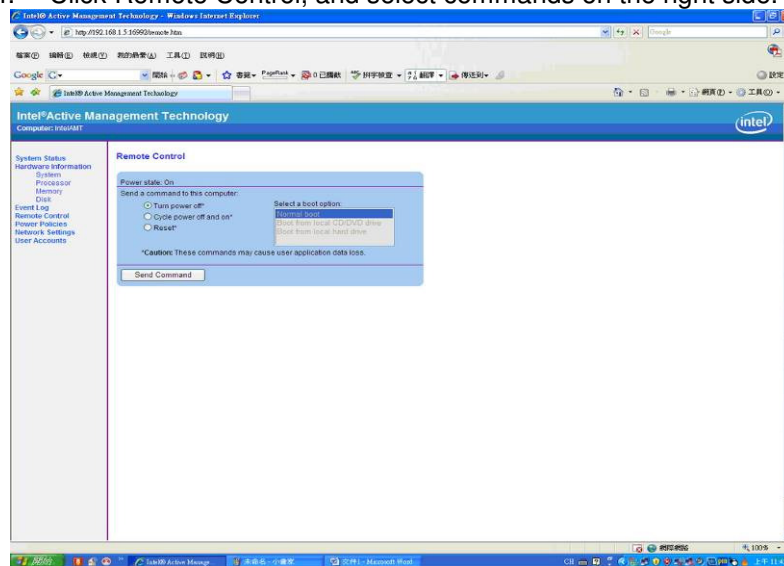


2. To log on, you will be required to type in username and password for access to the Web.
USER: admin (default value)
PASS: (MEBx password)

3. Enter the iAMT Web.



4. Click Remote Control, and select commands on the right side.



5. When you have finished using the iAMT Web console, close the Web browser.

APPENDIX C

Using the Watchdog Function

Start	
↓	
Un-Lock WDT	
	O 2E 87 ; Un-lock super I/O
	O 2E 87 ; Un-lock super I/O
↓	
Set WDT Function	
	O 2E 2D
	O 2F 20
Select Logic device	
	O 2E 07
	O 2F 08
↓	
Activate WDT	
	O 2E 30
	O 2F 01
Set Second or Minute	
	O 2E F5
	O 2F N N=00 or 08(See below
table)	
↓	
Set base timer	
	O 2E F6
	O 2F M=00, 01, 02, FF (Hex), Value=0 to
255	
↓	
WDT counting	

re-set timer

O 2E F6

O 2F M; M=00, 01, 02, FF (See below

table)

↓

IF No re-set timer

WDT time-out, generate RESET

IF to disable WDT

O 2E 30

O 2F 00; Can be disable at any time

N=00

M= 00h: Time-out Disable

01h: Time-out occurs after 1 second

02h: Time-out occurs after 2 second

03h: Time-out occurs after 3 second

.....

FFh: Time-out occurs after 255 second

N=08

M= 00h: Time-out Disable

01h: Time-out occurs after 1 minute

02h: Time-out occurs after 2 minutes

03h: Time-out occurs after 3 minutes

.....

APPENDIX D

AX93304 LCM Interface Specification

AX93304 LCM Data Sheet Revision History

Version	Date Published	Revised Comments	Editor
1.0.0	06/22/2010	Original Release	Jrtiger.Lee

1. Overview

1.1 Scope

The AX93304 (LCM) has developed by AXIOMTEK CO., LTD for system integration purpose. We can transfer the data to LCM for display through COM port. We also can pass through the function code to this NA device for program control purpose by button key of LCM.

1.2 Concept

Console PC can communicate with this NA device. The NA device can decode commands; then trigger the LCM. To show string and do function enabling through this way. The LCM has four key buttons. It can pass back the value of function key to COM port for any functioning active.

2. LCM Function specification

2.1 System Information

1. The console PC communicate with device through COM PORT.
 - a. Baud Rate = 9600
 - b. Data Bits = 8
 - c. Stop Bits = 1
 - d. Parity Check = None
2. COM Port only use two signal wire for Tx & Rx
3. PC and AX93304 (LCM) used the pin to pin cable with each other
4. LCM is 16x2, it can show 16 characters per row. The totally can show 32 characters in two rows. If the string length is over 32 characters, another will be stored in the RAM of LCM. But, it cannot be show off.

2.2 Data transaction method

The transaction is to call API Library by sample code, then to active the function call.

2.3 AX93304 Function Command

To get the key pressing status, a “read key” command can be issued to this module, which will check the key-pressing status and reply accordingly. The following are the commands which we can provide.

	Command function	1 byte command header	1 byte command function
		0xFEh	0x??h
1	Clear LCM	out(0xFEh)	out(0x01h)
2	Home cursor	out(0xFEh)	out(0x02h)
3	LCM Display off	out(0xFEh)	out(0x08h)
4	LCM Display on	out(0xFEh)	out(0x0Ch)
5	Cursor on	out(0xFEh)	out(0x0Dh)
6	Cursor blink on	out(0xFEh)	out(0x0Eh)
7	Shift cursor left	out(0xFEh)	out(0x10h)
8	Shift cursor right	out(0xFEh)	out(0x14h)
9	Shift display left	out(0xFEh)	out(0x18h)
10	Shift display right	out(0xFEh)	out(0x1Ch)
11	Set CGRAM address	out(0xFEh)	out (0x40h+offset)
12	Set cursor position	out(0xFEh)	out(0x80h+Location)

Display Address

This command can be used to place the cursor at any location. The corresponding address for each character on the screen is as follows:

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Location	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	Line1
(addressing)	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	Line2

2.4 Data transaction pattern

API Library

[PC->AX93304]

_init_com(ccom,9600,8,1,0); initialize COM Port , return any value is error parameter, "0" value is correct.

API function

```
// ccom=1,2,3,4 ;Baud=1200-115200;D_bits=Data
bits;S_bits=Stop bits;Prty=Parity bit
int _init_com(int ccom,unsigned long baud,int D_bits,int
S_bits,int Prty);
```

_Tx_data(char txd); Send character to LCM

API function

```
// Pass character to LCM
int _Tx_data(char txd);
```

[AX93304->PC]

_Rx_key(); access the value of button key in AX93304 (LCM), the value is, SW1:0x4E SW2:0x4D SW3:0x4B SW4:0x47

API function

```
// Read keypad from LCM ,Return 'N':SW_1 'M':SW_2 'K':SW_3  
'G':SW_4
```

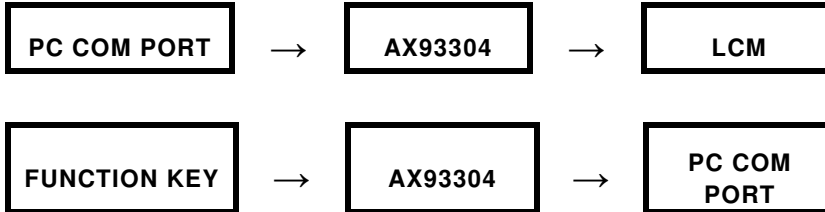
```
int _Rx_key(void);
```



More function call's detail can reference lcm.c sample code

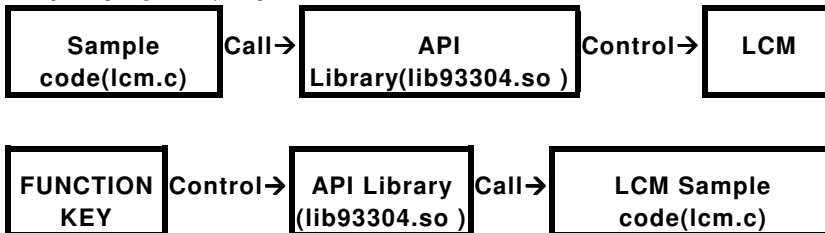
Control Procedure

DATA OUT PORT



Program file control

Linux Kernel 2.4 / 2.6



Step:

File 93304-bsp-user-<x.x.x>.tar.gz

→ tar zxvf 93304-bsp-user-<x.x.x>.tar.gz

→ cd ax93304

→ make (Install ax93304 lcm API shared Library in your system)

→ cd demo

→ make (Compile lcm demo program)

3.1 LCM Font Table

English font type with Arabic numerals is same with ASCII code. But, the rule is not including another special character.

Upper 4bit Lower 4bit		LLLL	LLHL	LLHH	LHLL	LHLE	LHHH	HLLL	HLHL	HLHL	HLHH	HHLL	HHHL	HHHL	HHHH
LLLL	CG RAM (1)		0	1	2	3	4	5	6	7	8	9	A	B	C
LLHL	(2)	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
LLHH	(3)	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
LHLH	(4)	`	a	b	c	d	e	f	g	h	i	j	k	l	m
LHLL	(5)	n	o	p	q	r	s	t	u	v	w	x	y	z	{
LHLE	(6)	}	~	!	"	#	\$	%	&	'	(	)	*	+	,
LHHH	(7)	-	.	:	;	<	=	>	?	@	A	B	C	D	E
HLLL	(1)	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
HLHL	(2)	T	U	V	W	X	Y	Z	[	\	]	^	_	`	a
HLHL	(3)	b	c	d	e	f	g	h	i	j	k	l	m	n	o
HLHH	(4)	p	q	r	s	t	u	v	w	x	y	z	{	}	~
HLLH	(5)	!	"	#	\$	%	&	'	(	)	*	+	,	-	.
HHLH	(6)	:	;	<	=	>	?@	A	B	C	D	E	F	G	H
HHHL	(7)	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
HHHH	(8)	W	X	Y	Z	[	\	]	^	_	`	a	b	c	d

APPENDIX E

WARNING

- This is a class **A** Product. In a domestic Environment this Product may cause radio interference in which case the user may be required to take adequate measures.
- It will be danger if battery is incorrectly replaced. Replacing only with the same or equivalent type is highly recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warning for Hard Disk Drive Selection:

TUV approved Hard Disk Drive is preferred for TUV compliance Hard Disk drive-Optional, (NWGQ2), generic, Input Voltage rated 5V dc/1.0A, 12V dc/1.8A maximum. Minimum clearance from uninsulated live parts 4.0 mm.

“The equipment is to be installed in an environment with maximum ambient temperature must not exceed 45°C.”

“The openings on the enclosure are for air convection hence protected the equipment from overheating.

DO NOT COVER THE OPENINGS.”

“Lay this equipment on a reliable surface when install.

A drop or fall could cause injury.”

“The equipment shall be installed according to specification as nameplate. Make sure the voltage of the power source when connect the equipment to the power outlet.

The current of load and output power of loads shall be not over the specification.” “This equipment must be connected to the reliable earthling before using.”



Electric shock hazard inside the redundant power supply

The exchange of modules shall be done by service person.